

The polar regions are the end-zones for those zooplankton (small animals drifting passively with sea currents) taxa that require cold water for their proper functionality. A few letters differentiating the name of both places (Ant-Arctic) not only indicate the location on the opposite side of the globe, but also highlight the differences that determine their dissimilarity, therefore, in the era of dynamic global changes, the biogeography of individual groups requires carefully planned and comprehensive research. Current knowledge of polar zooplankton is still insufficient, especially for other crustaceans groups than dominating in the World Ocean, copepods.

The aim of this project is to determine the differences in the pelagic Ostracoda (seed shrimps) assemblages in the Atlantic sector of Arctic and Antarctic waters by verifying (morphologically and genetically) their species structure, distribution (past and present) and role in two different polar ecosystems. This project is the first such large-scale planned study conducted simultaneously in both polar regions involving planktonic Ostracoda - an insufficiently known zooplankton group living mainly at the 200-1000m depths. Simultaneously carried out in both polar regions research will enable to verify very attractive and reasonable in the context of this zooplankton group – a concept of bipolarity. This phenomenon is defined as the "symmetrical" presence of identical or closely related zooplankton species in the Northern and Southern hemispheres. In this project, combined morphological and molecular analysis will allow taxonomical revision of selected Ostracoda species inhabiting the polar regions with particular emphasis on species assumed as bipolar (e.g., from genus *Obtusoecia* and *Boroecia*). In addition, this project will test the hypothesis that in consequence of global changes, only the Antarctic ecosystem will hold a unique, characteristic polar taxonomical composition, while the Arctic will no longer be a region inhabited mainly by typical polar zooplankton species due to the progressing "Atlantification" of this region.

The concept of bipolarity will be tested on the pelagic Ostracoda based on a very wide collection composed of historical and modern data. The archived data were collected in the 80' and 90' of 20<sup>th</sup> Century and in the last two decades of the 21<sup>st</sup> Century in both polar regions. Great benefit of this proposal will be including also historical *Discovery* materials from 20' and 30' of 20<sup>th</sup> Century (accessed thanks to dr Martin Angel from Natural History Museum, London). Arctic samples were collected in the Atlantic sector of the Arctic Ocean (including West Spitsbergen region and Greenland Sea), whereas Antarctic ones from the Antarctic Peninsula and Weddell Sea. Thanks to successful collaboration with the Shirshov Institute of Oceanology of Russian Academy of Sciences, Alfred Wegener Institute (AWI) and Norwegian Polar Institute (NPI) new samples will also be collected from both polar regions. All the collected Ostracoda will be subjected to microscopic taxonomic identification, and the newly collected will be additionally properly preserved for genetic analysis. Obtained sequences of all the species that inhabit polar waters today will be compared with previously published Ostracoda DNA "barcodes" stored in the Genetic Bank (NCBI). It is worth mentioning that some of the key Arctic Ostracoda have not been analysed molecularly yet.

Archiving a large collection of data gathered from many years and regions and comparing the historical results with the newly collected ones will enable to map (3D visualization) and finally, to model the distribution of selected (known as a good indicators) Ostracoda species. This will allow to verify the research hypothesis on bipolarity and predict changes in the Ostracoda distribution as a response to global warming. The planned research matches well the current needs for complex ecological research in these most harshly affected areas of the globe. The enormous effort put to gather coherent historical material and access to present Ostracoda material, possible due to such extensive international collaboration as proposed in the project, will open up hundreds of opportunities to follow new trends in the distribution and composition of zooplankton and in consequence to publish reliable and interesting for a wide audience results in prestigious scientific journals.